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Prehistoric Man

Hall of the Stone Age of the Old World

BY
HENRY FIELD
ASSISTANT CURATOR OF PHYSICAL ANTHROPOLOGY

FOREWORD BY BERTHOLD LAUFER
CURATOR, DEPARTMENT OF ANTHROPOLOGY

8 Plates in Photogravure and 1 Map



ANTHROPOLOGY
LEAFLET 31

FIELD MUSEUM OF NATURAL HISTORY
CHICAGO
1933

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The Anthropological Leaflets of Field Museum are designed to give brief, non-technical accounts of some of the more interesting beliefs, habits and customs of the races whose life is illustrated in the Museum's exhibits.

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CHELLEAN SCENE IN NORTHERN EUROPE ABOUT 250,000 YEARS AGO

Group I in Hall C

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FIELD MUSEUM OF NATURAL HISTORY

DEPARTMENT OF ANTHROPOLOGY

CHICAGO, 1933

LEAFLET NUMBER 31

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FOREWORD

A century of progress is being celebrated in Chicago during this summer. While a century may be regarded a considerable span of time in the life of a community, it is just a drop in the ocean compared with the long history of mankind and just an atom in the history of the universe. In the opening of Hall C, which depicts in eight dramatic groups human prehistory from its incipient stages in the Chellean period down to the dawn of recorded history, we are privileged to celebrate 250 milleniums or 2,500 centuries of progress—a progress brimming over with the most unusual human interest and tinged with the luring colors of adventure and romance. This reconstruction of man's past extending over a period of 250,000 years is a spectacle never attempted before in any museum of the world.

We may bemoan the fact that no historian's pen has chronicled for us the doings and sayings of the Neanderthals and Cro-Magnons and that we must laboriously restore their life and appearance from more or less fortuitous remains of mute bone and stone. What is to be regretted much more profoundly, however, is the fact that motion pictures have been invented too late. I would gladly sacrifice all mediaeval local chronicles of European towns and monasteries and throw the lives of the emperors and martyrs for good measure into the bargain in exchange for one contemporaneous motion picture reel taken of the life of the Neanderthals and Cro-Magnons and a dozen dictaphone records of their speech and songs, not to speak of the gain that would have accrued to our knowledge of

history and anthropology if Alexander the Great, on his conquest of Asia, had been accompanied by an army of camera men. The next best to the motion pictures of which we unfortunately are deprived is the drama in eight acts represented by the eight groups of prehistoric man and his culture reconstructed by the incomparable talent of Frederick Blaschke under the direction of Henry Field in Hall C. These restorations are as accurate in detail as warranted by our present knowledge. They are not dogmatic nor doctrinal, nor visionary nor sentimental. On the contrary, one of their beauties is their restraint, their simplicity, and above all, their power of suggestion. The artist who created these enchanting scenes does not try to be original by being different, but is original by being sincere; he takes us into his confidence, he makes us pause, reflect, and speculate, and allows us to turn our thoughts longingly back to eons of time that were still a sealed book to the preceding generation. The man who is able to produce such an effect of inspiration is a real artist and master. Another test of a great work of art is the permanence of the impression which it is apt to leave on our minds. No one who will spend only a few minutes in front of each of these groups will ever forget them; they live and endure in our memory, and their memory will always urge us with irresistible force to return to them. A new world has been opened here to all of us with plenty of food for thought and study.

BERTHOLD LAUFER

PREFACE

Prehistory is the study of prehistoric archaeology, which includes man's cultural and physical development from the earliest stages to the advent of writing. The fluctuations of climate during the various geological phases, together with the development of prehistoric races in various parts of the world and the study of fossilized human remains, also form divisions of this subject.

In 1690 a pear-shaped tool, associated with an elephant's tooth, was found near Gray's Inn Lane in London. In 1847 Boucher de Perthes published an account of shaped flints collected by him in the alluvial deposits of the Somme in northern France. This was the beginning of the study of prehistory.

During the past eighty years discoveries have been made in all parts of the world, although the existence of pre-Indian man has not yet been proved on the American continent. The study of prehistory, as a result of this world-wide quest, has contributed generously to our knowledge of the early history of man.

The story of the cultural and physical development of man from approximately a million years ago down to the dawn of history is shown in Hall C. This fascinating story is told by means of a series of eight large groups representing the more important stages in the development of man, together with a representative series of cultural objects comprising implements of flint and bone, sculptures and engravings, various household articles, and human remains. In order to make the relationship of one period to the following as clear as possible, the objects dealing with each division are exhibited in cases opposite the group portraying that period.

The plan for Hall C was completed with the cordial cooperation of many anthropologists, who made numerous suggestions, and in many cases offered their time and

services. Among those who have assisted in the development of the hall are the Abbé Henri Breuil, Sir Arthur Keith, Dr. Berthold Laufer, and Professor G. Elliot Smith. The following persons, whose names are arranged alphabetically, aided the project by generously giving advice: Professor Karel Absolon, Count Bégouen, Dr. Johannes Brøndsted, Professor Miles Burkitt, Dr. L. H. Dudley Buxton, Miss Gertrude Caton-Thompson, Miss Dorothy Garrod, Dr. William K. Gregory, Dr. Henri Martin, Dr. E. Hillebrand, Mr. and Mrs. Harper Kelley, Dr. R. Lantier, Dr. L. S. B. Leakey, Mr. J. Reid Moir, Professor Theodor Mollison, Dr. Hugo Obermaier, Mr. D. Peyrony, and Professor W. J. Sollas.

A generous share in the cost of Hall C has been assumed by Mr. Marshall Field. Other contributors are Mr. Frederick H. Rawson and Mr. Silas H. Strawn.

The data for the groups were obtained by Henry Field and Frederick Blaschke during the Marshall Field Archaeological Expedition to Western Europe in 1927. The prehistoric sites were visited in company with the Abbé Breuil, Henri Barrère, photographer, and Pierre Gatier, artist. Frederick Blaschke made a scale model for each group, and with the assistance of still and motion pictures, as well as colored sketches, samples of rock, and earth, these restorations were made. The painted backgrounds of the groups are due to the skill of Staff Artist Charles A. Corwin.

On exhibition in Hall C there is a series of reconstruction drawings of life in prehistoric times by the late A. Forestier, drawings of Pleistocene fauna by Frans Roubal, colored sketches by P. Cassien, and three oil paintings by Charles R. Knight.

The archaeological material was also obtained by Henry Field during the Marshall Field Archaeological Expeditions to Western Europe in 1927, 1928, 1930, and 1932.



NEANDERTHAL FAMILY AT DEVIL'S TOWER ROCK-SHELTER, GIBRALTAR
Group II in Hall C

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PREHISTORIC MAN

INTRODUCTION

The story of prehistoric man is hard to trace, since many of the details lie buried in the earth, or are lost beyond recall.

Within the past few centuries it was believed that the world was created in 4004 B.C., according to the chronology of Archbishop Ussher (1581–1656), and that man was the result of special creation. At the close of the first third of the twentieth century scientific workers have shown that hundreds of millions of years passed before any animal that could be definitely recognized as human had evolved upon the earth. The study of the animal kingdom, from both living and fossil forms, reveals the fact that long periods are represented by progress from simple one-celled organisms to many-celled, from fish to amphibians, from reptiles to birds and mammals, and so to the most advanced evolutionary product—man.

Branching off from the main primate stock several million years ago, our ancestors possessed many characters in common with the anthropoid apes, but, as time passed, the gap between the two branches grew wider. The cradle of man remains an enigma. The data at present available suggest that Asia is probably the continent upon which this differentiation took place. The chain of evidence upon which the prehistoric periods have been defined in chronological sequence may appear obscure to the layman, but the main facts become clearer as our knowledge increases, while minor details are always subject to revision.

Human remains are extremely fragile and even when buried are soon subject to decay. For this reason the chances of preservation are small, and the fossil remains of man are rare.

On the other hand, implements or artifacts of flint are practically indestructible and in western Europe form a valuable and reliable series of types which can now be chronologically arranged.

Our earliest ancestors probably used any stone which seemed to fit the purpose on hand, after which it was discarded. Later, a particularly serviceable stone might be retained for future use. Finally, the stone might be rendered still more useful by knocking off some flakes with a crude hammerstone. "Trial and error" must have been the method employed until a definite technique was evolved. The result of this experimentation is indeed confusing to the archaeologist, who finds it hard to differentiate between crude human flaking and the result of natural agencies such as heat, pressure and friction, thermal action, or grinding and crushing in the earth.

Let us visit a cave in western Europe, where the work of excavation is in progress. Provided that there has been no disturbance of the strata in the cave floor, the specimens of most recent date will lie nearest to the surface, while the deeper the excavations proceed, the older will be the objects unearthed.

Each square yard of the cave floor is pegged out and is given a number. The earth is removed over the entire floor to a depth of one foot. The greatest care is used in removing this stratum of earth, which is passed through sieves of various sizes to ensure the finding of even the smallest objects. As each object is found, a mark is made on a map of squared paper in the corresponding square-yard number allotted to that part of the cave floor. Trained scientists are in charge of the work and take notes which are filed for study.

From the animals and plants found buried in the deposit the excavator can determine whether the climate was cold, warm, or tropical. A comparison of the numerous caves and rock-shelters, particularly in France, has

made it possible to form a definite chronological sequence of implements based on their types and layers of deposit.

The earliest human remains have been found in Asia. The discovery of a fossilized human skull in China in 1929 is an event of paramount importance. Prior to this date, various human teeth and two lower jaws had been found during excavations in the same site at Chou Kou Tien near Peiping. The scientific name given to the Peking man is *Sinanthropus pekinensis*. The brain case reveals a curious blend of characters, some of which were hitherto regarded as distinctive of the Java Man, and others of the Piltdown Man, both of whom are described below. A second skull of a young adult was found during the following year.

According to Elliot Smith, "*Sinanthropus* enables us to picture the qualities of the original members of the human family which, though human, was curiously ape-like, and obviously close to the main line of descent of modern man." The Abbé Breuil made a special journey in 1932 to examine the deposits at Chou Kou Tien. He reports that *Sinanthropus* was able to make fire and to shape implements from quartzite and bone, which were in some instances similar in character to those made by the early inhabitants of western Europe. The deposits in which these human remains and artifacts were found belong to a period approximately one million years ago.

In England flint implements of approximately the same date have been found in Pliocene gravels at Ipswich and in the Cromer Forest Bed, but up to the present time no human remains have been unearthed in either locality.

These discoveries prove that the ancestry of man goes back to a more remote past than had been supposed.

In 1891 Dr. Dubois discovered in Java the top of a skull, the left thigh-bone, and two molar teeth of an individual known to science as *Pithecanthropus erectus*, which means "the ape-man walking erect." The fragment of the skull shows a low, retreating forehead with huge

brow-ridges. The estimated capacity of the Java skull, when restored, is 900 cc. This figure is intermediate between that of the largest gorilla and the smallest average of any modern race. The brain capacity indicates the potentiality for organized thought and reason. From geological evidence it is roughly estimated that this ape-man roamed beside the banks of the Bengawan River in Java about half a million years ago.

THE PALEOLITHIC OR OLD STONE AGE

THE CHELLEAN AND ACHEULEAN PERIODS

The earliest human remains found in Europe belong to the Chellean period, so called from the type station at Chelles in northern France. This period began some 250,000 years ago and was of long duration. The climate was mild, and the elephant, rhinoceros, and hippopotamus wandered over Europe. The cleaver or hand axe (*coup-de-poing*), which is found preserved in the river terrace gravels, was the typical implement of the period. This tool was roughly chipped on both faces with an enlarged base, often bearing part of the nodular crust intact, presumably so that it might be used as a hand axe.

Chellean man must have been rugged, powerful-jawed, and ferocious in appearance to our eyes. The earliest human remains from Europe were found at Mauer in Germany and near Piltdown in England. In 1907, eighty feet below the surface in the great Mauer sand pit near Heidelberg, a fossilized human lower jaw was discovered. This massive jaw was associated with the remains of *Elephas antiquus* and *Rhinoceros etruscus* and fragments of other mammals which became extinct long ago. The most interesting feature of the jaw is the entire absence of a chin and the relative smallness of the teeth, which lack ape-like characters in the canines.

In 1911 fragments of a human skull were found, this time in a gravel pit near Piltdown in Sussex. Associated with the fragments were crudely worked flint tools and

fossilized animal remains, including the *Mastodon*, *Stegodon*, hippopotamus, stag, horse, and beaver. These were in a heavily mineralized condition and of a dark brown color, as were the human bones. This individual is referred to as the Piltdown Man or *Eoanthropus dawsoni* (that is, the dawn-man, discovered by Charles Dawson). The bones of the skull are tough and hard, and the walls of the brain case are remarkably thick.

Chellean man had knowledge of fire, which at night enabled him to keep off marauding animals. He developed the art of flaking flint to a relatively high degree of perfection. However, with only wooden spears and hand axes for weapons, he must have been more hunted than hunter. It is interesting to recall that during the Chellean period these primitive men could walk from France to England, because at that time the English Channel had not been cut.

At the close of the Chellean period the climate was becoming colder, and the mammoth, woolly rhinoceros, and other cold-loving fauna made their first appearance in western Europe. Thousands of generations passed, during which the art of flint-flaking improved. The new and advanced technique is distinguishable, and is attributed to a race of people called Acheuleans, named after the type station at Saint Acheul in northern France. Their sharp-edged flint axes were hafted in wooden handles.

The geographic distribution of Chellean and Acheulean cultures is as follows, although no contemporaneity is implied: Belgium; England; France; Germany; Italy; Monaco; Poland; Portugal; Spain; North, Central, and South Africa; and the area stretching from Palestine to India.

In Hall C, Group I shows a typical Chellean scene in northern France. In the foreground, squatting beside a fire in the shelter of a large rock, are two Chellean hunters, one of whom is chipping a flint hand axe preparatory to the hunt on the morrow. In the distance

is a meandering river, and on the opposite bank three elephants are frightened from their watering-place by the fire. Farther upstream a hippopotamus can be seen on the bank. Near the skyline, a magnificent stag, anxiously watching the flickering light, protects his hinds from the scent of danger. Stealing through the underbrush, a pack of wolves is distinguishable.

The scene recalls vividly man's plight, as well as his strength, during Chellean times. A great variety of fierce animals dominated the earth. Man, small in numbers and physically weak in comparison with the creatures which surrounded him, was forced to use ingenuity and his powers of reason, in order to maintain himself in a hostile world. The moonlight effect symbolizes the dimness of our knowledge of that early period.

In the hall is shown a magnificent tusk of *Elephas antiquus* from Steinheim an der Murr, Württemberg, Germany. The length of the tusk is 285 cm, and the maximum diameter is 52 cm.

In Case 1 are displayed casts of human remains, including fragments of *Sinanthropus*, *Pithecanthropus*, *Eoanthropus*, and *Heidelbergensis*, together with typical fauna from Mauer. On the opposite side of the screen, series from the Pliocene gravel beds at Ipswich and the Cromer Forest Bed are exhibited. There are also a series of Chellean implements from the river gravels of northern France and, for comparison, examples from England, Spain, Africa, and India.

In Case 2 a group of Acheulean and Levallois flint and quartzite implements is exhibited, together with representative examples from Africa and India.

THE MOUSTERIAN PERIOD

Another long interval of time found Europe still under the effects of a cold climate, the approximate date being 50,000 years ago. The mammoth (*Elephas primigenius*), the wild reindeer (*Rangifer tarandus*), and other cold-

loving animals wandered over western Europe. Fragmentary remains of a human skeleton of this period were excavated in the year 1856 at Neanderthal near Bonn in Germany. It was distinguished because of the huge brow-ridges and other anatomical peculiarities, which were at first thought by R. Virchow to be the result of some pathological condition. Since that time a series of Neanderthaloid skeletons (that is, typologically similar to the original Neanderthal skeleton) has been found, which enables restorations to be made.

In 1908 a human skeleton was found at a depth of five feet below the floor of a rock-shelter at Le Moustier in the Dordogne region of France. It is thus described by Sir Arthur Keith: "Further excavation was stopped until the autumn, when, surrounded by a company of German anthropologists, in the heart of France, the skeleton was finally extracted from its ancient bed, with expert eyes looking on to bear witness to its authenticity and antiquity. The skeleton was that of a lad of perhaps sixteen years of age; his canine teeth and third molars were not fully erupted; the growth lines of the long bones were unclosed. There could be no question: he had been deliberately buried. Near his right hand was a hand axe of the Acheulean culture, but typical implements of the Mousterian period were near-by. Charred remains of the ancient ox—the urus—were noted. The body had been laid on its right side, with the face turned down, and a pillow of stones placed under the head."

From these two type localities the names given to the race and to the culture have been derived, the human remains generally being regarded as belonging to a separate species of man, *Homo neanderthalensis*, while the cultural objects are classified as Mousterian.

Since these discoveries, remains of a number of members of this race have been unearthed in various localities widely distributed over western Europe, and their racial characteristics have become well established.

The distinctive features of the culture are also now well known. Flint and quartzite implements of Mousterian type have a wider range of distribution than have the skeletal remains. They have been found in Great Britain, France, Spain, Gibraltar, Italy, Germany, Moravia, Russian Poland, Croatia, Crimea, Asia Minor, Palestine, Syria, Egypt and other parts of Africa, the North Arabian Desert (by Field Museum North Arabian Desert Expeditions, 1927-28), Iraq, and China.

From the skeletons left by this race it is now possible to derive a definite idea of the general appearance of a typical Neanderthaler. Short in stature, with an average height rarely exceeding 5 feet 4 inches, he was thickset, possessing a large head and short limbs. The head, thrown slightly forward, was carried in that position by strong neck muscles. The knees were always slightly bent, due to the curvature of the thigh-bones. To our eyes his face must have had a fierce expression, emphasized by the enormous brow-ridges, small, round eyes, and broad, flat nose. The teeth and jaws were powerful, corresponding with the massiveness of the skull.

The low forehead reduced the space for the development of the frontal lobes of the brain, but this reduction was compensated by the protrusion of the occipital region at the base of the skull. Cranial capacity, however, is no criterion of intelligence, but merely suggests a latent potentiality. Many complex factors seem to be at work, and within certain limits of size, quality, not necessarily quantity, seems to be the sponsor of genius. According to Boule and Anthony, the brain of Neanderthal man possessed several primitive characters. For example, the prefrontal area, which is the seat of the higher faculties, was not fully developed in him, and had a protuberance similar to that found in the brain of anthropoids. Furthermore, the lobe associated with the power of speech was little developed, as compared with that in modern man. The hands and feet were large,



AURIGNACIAN ARTIST IN CAVE OF GARGAS, FRANCE
Group III in Hall C

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and the great toe was separated to some extent, as in the anthropoids.

The Neanderthal hunters found that a fire built near the entrance to a cave formed excellent protection from wild animals, such as lions, bears, and hyenas, and also shielded them from the cold climate.

Neanderthal man was probably the first to seize a woman and protect her from animals and other men. This was the beginning of family life. The struggle for existence was hard, and there was no time for relaxation and the development of the artistic sense. The stone implements show marked improvement in design, workmanship, and technique over those of the preceding periods. Flint knives, scrapers, and points of various kinds suggest many uses, including the scraping and dressing of skins for clothes. Animal bones found in refuse heaps bear scratches made by scrapers in taking off meat, and cuts made by flint knives in disarticulating the joints. Bruised cuts on some of the bones show that they were used as anvils or chopping blocks. At La Quina in the Charente district of France, small, round balls of limestone shaped by the hand of man were found. It has been suggested that they may have been used as *bolas* by the Indians of South America at present, for hobbling wild animals.

Sollas gives the following description: "The debris of the caves show man of that day to have been a successful hunter, courageously maintaining his existence amid a crowd of competing beasts of prey. But in one instance, at least, we seem to discover signs of a more ogreish disposition; for the hearth at Krapina in Croatia contains the charred bones of numerous human beings, both young and fully grown men, women, and children. This impressed its discoverer, Gorjanovic-Kramberger, with the idea of cannibalism. Considering that the evidence is confined to this single cave and that we meet with nothing similar, or at least so definite, on the Mousterian

horizon in other parts of Europe, we may regard this for the present as an isolated instance. There is no reason to suppose that cannibalism was common or widespread, and still less reason for assuming that the human race has passed through a cannibal stage."

On the contrary, two observed instances of ceremonial interment of the dead seem to give evidence of reverence for the departed and belief in a future life. One of these instances is in connection with the skeleton found at La Chapelle-aux-Saints. It lay in a shallow grave extending from east to west. Around it were a great number of well-worked implements of Mousterian type, fragments of red ochre and broken bones. Over the head were several long bones lying flat, one of them still in connection with some of the smaller bones of the foot and toes, suggesting that it was clothed with flesh when placed in this position. Here was apparently then a ceremonial interment accompanied by offerings of food and implements for the use of the deceased in the spirit world.

In Field Museum there are two Neanderthal groups, one located in the Hall of Historical Geology (Hall 38), the other in the Hall of the Stone Age of the Old World (Hall C). Hall 38 is devoted to exhibits illustrating in chronological order life on the earth from its dawn down to the appearance of man. For this group the upper rock-shelter at Le Moustier was selected as a typical location for the reconstruction of a Neanderthal family scene. The story of how data and material for this group were collected, accompanied by six plates illustrating the reconstructions of various members of a Neanderthal family, is published in Field Museum Geology Leaflet, No. 11, entitled "Neanderthal (Mousterian) Man."

In Hall C (Group II) a Neanderthal family is represented on the sandy platform outside the entrance to the Devil's Tower rock-shelter at Gibraltar. Silhouetted against the deep blue of the Mediterranean stands a young man with a wooden club in his hand. He is

watching intently some movement on the beach below, since he and his family are open to attack only from this direction. Squatting beside the embers of the fire is the father of the family. He is watching the mussels open as the heat penetrates the shells. His little son, aged five, anxious to help his father, is bringing a small twig to replenish the fire. In a cleft in the rock, the mother can be seen carrying her youngest baby on her hip. This scene shows a Neanderthal family living under warmer climatic conditions than did their relatives at Le Moustier.

Among the cultural objects shown in Case 2 are representative series of flint implements from the lower, middle, and upper Levallois deposits. There are shown in Case 3 flint and bone implements from La Quina (Charente), Le Moustier, La Ferrassie, La Micoque, Combe Capelle, Laussel, Abri Brouillard, Grottes des Cottés (Vienne), and the type collection from the Grotte des Grèzes, including reindeer antlers used by Neanderthal hunters. As to human remains, there are an original Neanderthal molar tooth from France and two skull fragments of a Neanderthal child from Le Moustier, excavated by O. Hauser. There is also a series of casts of the more complete Neanderthal skeletons excavated in various localities of Europe.

To show the same types of tools from various parts of the world, although this does not imply a contemporaneous culture, there is a small selection from North Africa, Kenya Colony in British East Africa, and quartzite tools from Shui-tung-kou, China, presented by Abbé Teilhard de Chardin and E. Licent.

The Mousterian period in Europe may have lasted 100,000 years, but finally Neanderthal man probably became extinct. It has, however, been stated that certain Neanderthaloid characteristics occur among the modern inhabitants of southwestern France.

The Neanderthal hunters had developed the use of fire, a new variety of flint and quartzite implements, the

beginning of family life, and believed in a future existence. Considering these important advances we must recall with pride the struggles of our Neanderthal predecessors against an inhospitable climate and savage animals.

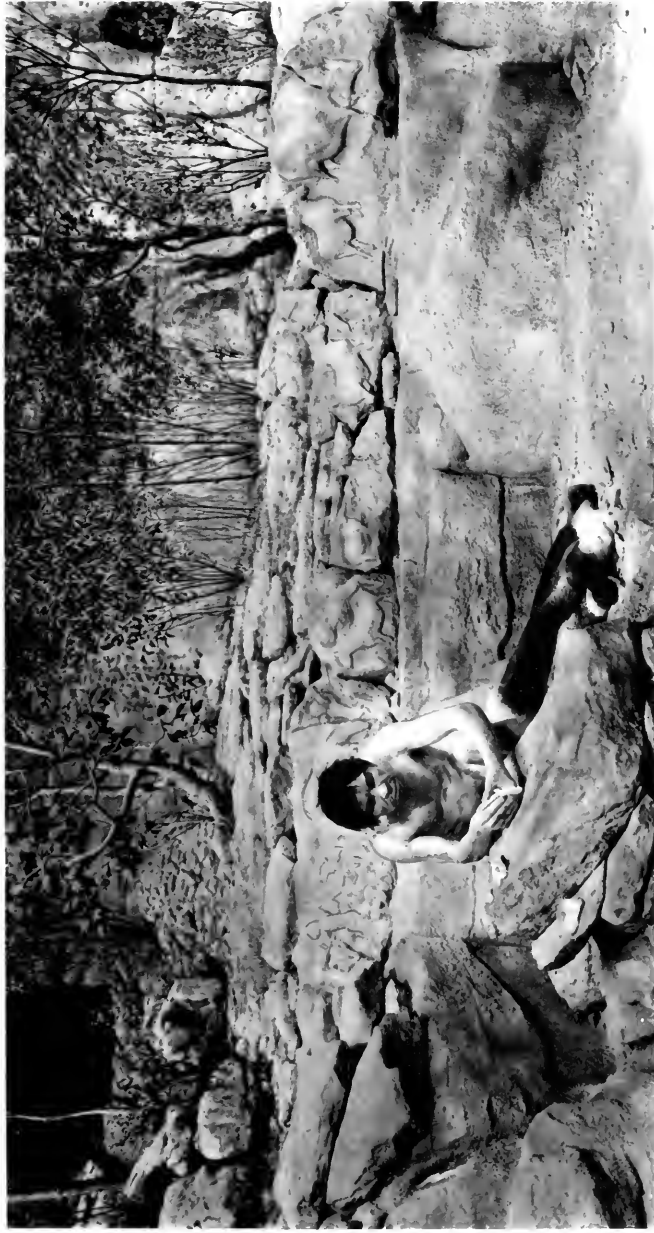
THE AURIGNACIAN PERIOD

About 30,000 years ago the climate of western Europe was still extremely cold. There is evidence for the fact that Europe was invaded by a new race of people, called Cro-Magnons, who came from Asia at that time. The name of the race is derived from a small cave in the Vezère River Valley, in the Dordogne region of France, where Lartet found several skeletons and artifacts. The Cro-Magnons were different in physical appearance and culture from their predecessors, the Neanderthal hunters.

Some seventy years ago, near the foothills of the Pyrenees, the small cave of Aurignac yielded human skeletons and flint tools of new types. Lartet called this culture Aurignacian, after the type locality. In other words, the Aurignacians were those Cro-Magnons who used tools such as were found in the cave of Aurignac, Haute-Garonne. The Aurignacians seem to have spread from southwestern Asia along the coastal region of North Africa into Spain and France. Evidence of their culture is also found along the Danube River and in central Europe, extending eastward into southern Russia.

The Cro-Magnons undoubtedly belong to the direct ancestral line from which large groups of modern peoples are descended. From the anatomical point of view it would be hard to differentiate between the Aurignacian and the neolithic population, which inhabited Europe some 20,000 years later.

The Cro-Magnons, who lived in western Europe, were people of magnificent physique, tall in stature, with a large cranial capacity. During the same period there seems to have been a Negroid race whose skeletons were excavated in the cave of Grimaldi near Mentone



SOLUTREAN SCULPTOR AT LE ROC, FRANCE
Group IV in Hall C

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in the south of France. The Grimaldi race probably invaded southern Europe from the African continent.

During this period the struggle for food became less intense due to the abundant game supply. As a direct result there was time for the development of a latent artistic sense. Here is the dawn of art.

In their cave-dwellings, the Cro-Magnons began to adorn the walls with engravings and paintings. Natural resemblances to animals upon the walls were accentuated by scratches with a flint tool or by the application of some colored pigment—red, yellow, black, or white. Animals carved upon sections of bone or ivory or on the smooth surface of a small stone were used as models, to simplify the faithful and accurate reproduction of the animals on walls in the innermost recesses of the caves. Life-like representations of animals and occasionally of human beings were painted or sculptured on the walls or ceilings of caves in France or Spain. In order to light the caves, animal fat was burned in stone lamps. The Eskimos use this type of lamp at present, with wicks of finely rubbed moss, in order to light and heat their houses. The mammoth and the cave-bear supplied the necessary fat, and the large marrow bones of the reindeer, bison, and horse provided the oil required.

Small human figurines, emphasizing male or female characteristics, have been excavated from upper paleolithic sites in western Europe. Each female figurine is called a "Venus," as, for example, the "Venus of Laussel" in Case 5. This term simply means that these figurines are supposed to represent the ideal of feminine beauty of that epoch.

Personal ornament was also a new development, apparently introduced during that period. Necklaces of reindeer teeth, sea shells, or fish vertebrae were worn. Ivory beads probably corresponded in value to modern pearls. The Aurignacian hunters may have painted their bodies with red ochre. We find their dead buried

in a coating of this coloring material. This custom was probably connected with the belief that blood was synonymous with life. We can, therefore, presume that they were buried thus, together with their finest shell ornaments, their most useful tools and weapons, to make an imposing appearance in the new life beyond the grave.

In Hall C (Group III) is reproduced the frieze of hands preserved in the cave of Gargas, situated in Haute-Garonne, southwestern France. An Aurignacian is resting on his left knee with his left hand held firmly against the wall with the fingers outspread. In his right hand he holds a hollow bone tube prepared from the leg-bone of a reindeer. By means of this tube, placed against the lips, powdered red ochre is blown around the outlines of the fingers, so that when the hand is removed an imprint remains on the wall. The cave is illuminated by a fire which burns in the center of the chamber, and by a sandstone lamp resting on a natural shelf below the artist. On the ground near-by are a pestle and mortar, used for powdering the ochre, and the shoulder-blade of a cave-bear upon which part of the coloring material has been mixed with grease. On the wall are numerous imprints of hands, some of which appear to have been mutilated. There are also animals, including the elephant and the bison, drawn upon the wall.

Overhead the stalactites glisten in the glow of the fire. From the back of the cave another Aurignacian is coming toward the sanctuary, his face illuminated by the sandstone lamp which he carries. This scene shows the dawn of art, magic, or religion, because at that time it would be difficult to differentiate between them. The cave was reproduced from studies made at Gargas and from a scale drawing of the frieze made by P. Gatier, under the direction of the Abbé Breuil.

Paleolithic representations of the hand occur in twelve caves in the Pyrenean and Cantabrian regions. Furthermore, positive and negative imprints of hands have been

observed on the walls of caves in California, Arizona, Peru, Africa, and Australia. The red hand has been found in Egypt, Palestine, Arabia, Babylonia, India, Phoenicia, and Mexico. There are thus many modern parallels of curious rituals in connection with the imprint or mutilation of the hand.

The question as to the motive which prompted the mutilation of the hand has produced several interesting theories based on customs among modern primitive peoples. For example, in the early nineteenth century, travelers among the Bushmen in South Africa recorded that the women cut off their little fingers with stone knives as a sign of mourning. This was to ensure a long career of feasting after death or a safe passage to the next world. Among other tribes this mutilation was a sign of caste, a tribal mark, or a cure for sickness. The American Indians practised the custom until recent times. Among the Haida of Queen Charlotte Islands, the last joint of the little finger was amputated "to cut off the deaths" in a family where many bereavements had taken place. Catlin described the removal of the forefinger and little finger of the left hand during the initiation ceremony of the Mandan Indians. In the Pacific area Captain Cook reported that in Tonga the finger was sacrificed to propitiate the god Atoa.

In Hall C the culture of the Aurignacian period is represented by a series of flint and bone tools from the various cultural levels, which comprises the following: Châtelperron points from the lower Aurignacian level at La Quina; the type collection from Tarté, Haute-Garonne, with split-base lance-points and many bone and flint tools; and a cave-bear skull from Gargas. Among the important objects in this hall are the middle Aurignacian necklaces from La Souquette, near Sergeac, Dordogne. These beads made from mammoth ivory, shells, teeth, and pebbles are regarded as belonging to the oldest necklaces yet discovered. An excellent series

of artifacts from the Aurignacian deposits at Predmost, Vistonice, Ondratitz, and Sipka in Moravia is shown in Case 6. There is also a representative series of fauna including mammoth, rhinoceros, cave-bear, cave-lion, wolf, hyena, and others, from a great mammoth pit in Moravia. On the wall is an enlarged photograph of this mammoth pit, showing the bones excavated under the direction of Karel Absolon.

There are also collections from Laussel, Abri Labatut, and Abri Blanchard, and comparative material from North Africa and Kenya Colony. Casts of the more important human remains are also on exhibition, together with original drawings by the late Amedée Forestier.

THE SOLUTREAN PERIOD

During this period the climate grew colder; the horse and the wild reindeer were the chief sources of food supply. Along the banks of the Danube another race of people was wending its way until it finally swung westward along the central massif of Europe into southwestern France and northern Spain. These invaders were called Solutreans, after the type station at Solutré, described below (p. 23). In appearance they were almost identical with the modern Eskimo. Despite the fact that they made some sculptures of an imposing character they were probably inferior in physique and mental capacity to their predecessors, and their artistic expression appears less developed than that of the Aurignacians. The Solutreans, however, were able to make flint spearheads and lances by means of a peculiar technique, which has been termed the "Solutrean retouch." The blades, shaped like laurel leaves (*pointes en feuille de laurier*), and other new forms of tools show that these people were masters of a flint-knapping technique, which had not appeared previous to that time. This degree of perfection only reappeared in late neolithic times in Denmark, Egypt, and the New World. The delicate flaking was performed

by means of pressure with a bone tool, requiring a steady hand and an accurate eye. The Solutreans also developed a "shouldered point," which was a slender dart notched so that it would remain in the flesh of an animal. They also made javelin points of bone.

The type station of the Solutrean epoch is Clos-du-Charnier in the commune of Solutré, near Maçon, Saône-et-Loire. The station of Solutré is located on the south side of an outcrop of Jurassic limestone. In 1868 the Abbé Ducrost commenced excavations in the Solutrean deposits and unearthed many laurel-leaf-shaped points, bone and horn polishers, red and yellow fragments of ochre used for colors, perforated animal teeth, and carvings on bone and stone. As to animals, there were fragments of the mammoth, reindeer, horse, ox, wolf, and the cave-dwelling bear and hyena. Below the Solutrean deposits were several Aurignacian levels, which contained a large number of horse bones. It has been estimated that fragments of about 100,000 horses are contained in this deposit. The species of horse resembles the *Equus przewalski*, which now wanders over the plains of the Gobi desert. A number of human skeletons were also excavated, but up to the present time it has been impossible to prove that they were not intrusive burials of a comparatively recent date.

Engravings attributed to that period comprise the head of an antelope from La Cave in the department of Lot, a horse from Solutré, a mammoth from Ardèche, and another from Bavaria. Solutrean sculptures have also been found at Fourneau du Diable in the Dordogne. Recent discoveries by Henri Martin in the valley of Le Roc, Charente, have thrown an entirely new light upon the art of that period. This valley is bounded on each side by cliffs. On the cliff above the right bank there is a cave with a broad platform below, utilized by the Solutreans. The quantity of burned bones, ashes, and calcined pebbles indicates a long period of occupation.

There were many flint tools and rejects pointing to the fact that part of this platform was used as a workshop. At the back of the platform were large blocks arranged in a semicircle. In order to continue the excavations below these blocks, they were removed. However, when the first block was overturned, two animals were discovered sculptured on the side which had been lying face down. The remaining blocks were disengaged and set back in position on a natural ledge from which they had been thrown by enemies or had fallen.

A detailed study of this magnificent frieze suggests that it was executed by several artists. Since traces of manganese were found on the sculptured surface, it seems probable that the bas-relief was enriched by color. Looking from left to right, we can observe on the first block a figure representing a masked human being with bent legs, in an attitude suggestive of dancing. Next come two small horses and, below, another animal with elongated muzzle and raised tail. A musk-ox follows, his head lowered, in the act of charging a man, who is fleeing in terror. The next block portrays a short-legged horse, which is next to a sculpture of a horse and the traces of an ox destroyed by the sculptor. The block on the extreme right shows a small horse following a fantastic animal with a head like that of a boar or a carnivore, an elliptical eye, an elongated muzzle, pointed ears, and no horns. The animals are represented as walking and the precision of movement reveals an accurate power of observation. The most interesting feature of the entire frieze is that all the animals represented are pregnant. We may thus suppose that a wish for fertility is a possible explanation. Below a shelter of stone blocks three Solutrean skeletons were unearthed. It seems probable that these Mongoloid peoples invaded western Europe at the close of the Aurignacian period.

In Hall C (Group IV) the Solutrean frieze of Le Roc has been reproduced through the courtesy of Henri Martin,

who made casts from the five original sculptures for Field Museum. The blocks have been arranged in the position in which they were placed by the Solutrean artists. On the left side the path leads up to a cave, and on the right side, sheltered behind large trees, the entrance to another cave can be seen. The painted background suggests the general location and the type of vegetation existing at that time. In the foreground a Solutrean sculptor, with physical characters of Mongoloid type, is shown at work, carving a horse on a block of stone. There are flint chips and flakes from Le Roc scattered on the ground. In Case 7 a series of artifacts from Le Roc, Laugerie Haute, and other French Solutrean stations, is shown, together with the type collection from Solutré. There are a fine collection of *feuilles de laurier* and one beautiful dagger whose delicate retouched flaking shows the technique of these master craftsmen.

The climate slowly changed, and the reindeer retreated northward to their present homelands. It has been suggested that the Solutreans followed the migrating herds, and may be the ancestors of the modern Eskimo.

THE MAGDALENIAN PERIOD

The cold climate again settled over Europe during this period. In Switzerland the glaciers extended far down the mountain slopes below the present snow line. The Alpine animals were driven down to the plains where the mammoth, woolly rhinoceros, reindeer, musk-ox, bison, wild horse, and many other animals wandered across the meadows. The large cave-bears struggled with the Magdalenian hunters for possession of the caves. As to bird life there were whistling swans, arctic grouse, ducks, geese, and the ptarmigan.

At the base of an overhanging limestone cliff stands the great rock-shelter of La Madeleine, where in 1865 Lartet and Christy excavated a new prehistoric culture subsequently called Magdalenian. These invaders prob-

ably came into France from the northeast, since they left no traces along the shores of the Mediterranean. The Magdalenians were members of the Cro-Magnon race, although they were different from the Aurignacians or the Solutreans. They possessed long, narrow heads with broad faces. This rare combination is known as the "disharmonic" type. The brow-ridges were prominent over large, rectangular eye sockets. Medium in stature, with well-shaped heads and pleasing features, the Magdalenians must have been an imposing race.

Since food was abundant, more time could be given to the development of art. The Magdalenians produced the finest naturalistic art of prehistoric times.

Flint workmanship declined, but the working of bone became an important factor in the life of the people. Among weapons there were spear-throwers and harpoons of various kinds, while bone needles, awls, and other articles were the domestic equipment. In order to light the caves, animal fat was burned in crude stone lamps.

Let us visit one of those caves in southwestern France to examine some of the famous cave paintings. Cave equipment, such as matches, candles, acetylene lamps, ropes, and rope ladders, is carried to the mouth of the cave by guides. The lamps are lit, and in single file we enter the dark mouth of the cave. It is relatively easy to walk the first few hundred feet. The cave walls are damp, and there is a constant drip of water from the roof. The men in front are silhouetted against their swinging lamps, and their echoing voices sound weird and eerie. Traveling becomes increasingly difficult, and progress slower as we slip and slide on the sloping, wet floor. There are places where a rope is necessary in order to descend to steep and narrow parts of the cave. The beautiful stalactite "curtains" appear majestic by the light of our lanterns and candles. After some hours of perilous climbing, we reach a rock gallery where, with the aid of our flickering lights, we see the impressive paintings and



MAGDALENIAN FRIEZE, CAP-BLANC ROCK-SHELTER, FRANCE

Group V in Hall C

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engravings of animals made by prehistoric man many thousands of years ago. The subjects selected represent for the most part animals hunted by the Magdalenians. In the same manner as primitive peoples at present, these prehistoric hunters possessed the faculty of carrying visual pictures of moving animals, and furthermore were able to reproduce these pictures faithfully on the cave wall. The difficulty of access and the true realism of the pictures leave a lasting impression on our minds. There seems to be little doubt that the artist would not have chosen such inaccessible wall surfaces upon which to paint his pictures if his purpose was merely art for art's sake.

It is probable that these paintings were inspired by some magico-religious motive. This may be illustrated by the following example: A hunter is going out to hunt reindeer tomorrow. Food has been scarce, and his family is hungry. After dark he goes to the medicine-man of his tribe, who leads him into the cave, which fills him with awe. After a long and perilous climb, during which the sound of running water and strange echoes have duly impressed the hunter with the sanctity of his surroundings and the fearlessness of his leader and master, they reach the innermost chamber. Here the medicine-man makes incantations before the picture of a reindeer painted on the cave wall. To the primitive mind the spirit of the living animal is embodied in the painting. The medicine-man therefore has power over the wild reindeer, a power which he transfers to the hunter by means of ritualistic incantations. The next day the hunter goes out with renewed confidence and is successful, as the medicine-man has predicted.

The human form is rarely represented in Magdalenian art. The prehistoric hunters probably feared that realistic portraits of themselves might supply to their enemies the same magical power which they believed themselves to possess over the animals hunted by them.

Outlines of animals were engraved upon implements of the chase. A grazing reindeer carved upon the handle of an implement implied that the hunter would have more chances of finding the reindeer so occupied in grazing and that it would not notice the stealthy approach of the hunter. The unsuspecting reindeer would thus fall an easy prey to this particular weapon.

The herds of reindeer must have been a remarkable and impressive sight, as they wandered over the frozen soil. Food was plentiful, and various forms of traps were sometimes used to capture these animals. When an animal was caught in one of the traps, the women and children were left in the family rock-shelter or cave in charge of the old men, while the young hunters, armed with their bone-tipped weapons, went to kill their prey. It must have been a great triumph for the man whose weapon pierced the vital part, and a great reception would be in store for him when the hunters returned home.

At the present time a group of African natives, when out lion-hunting, hurl all their spears at the lion simultaneously. After the lion is pronounced dead, the spear which has reached a vital part is withdrawn. Its owner comes forward to receive the much-prized tail, which is cut off and given to him to wear, so that everyone will recognize him thereafter as a lion-killer. It is possible that the Magdalenians practised a similar ceremony.

The majority of caves containing famous examples of art and human remains of prehistoric man are located in France and northern Spain. The most prominent example of Magdalenian sculpture was found in a small rock-shelter called Cap-Blanc, which overlooks the beautiful valley of the Beune River in the Dordogne region of southwestern France. In 1910 a series of early Magdalenian implements was unearthed. Various types of flint scrapers and engraving tools were found. A frieze of six horses is carved in high relief on the wall. The life-size central figure is the work of a great sculptor.

During the course of excavation a workman accidentally drove his pickaxe into a human skull, and a complete skeleton was unearthed. Small blocks of stone had crushed the skull. The body, covered with small stones and debris, was lying on the left side with the left arm flexed. The legs were drawn up and interlocked. The right elbow rested on the right knee with the hand covering the face, which was turned on the left side. The bones themselves show no signs of disease, and from the condition of the teeth it is estimated that this individual was about eighteen years of age.

In Hall C the Cap-Blanc rock-shelter has been reproduced (Group V), showing part of the frieze of horses and a modern skeleton placed in the same position in which the original was found. The painted background shows the location of Cap-Blanc above the valley of the meandering Beune River. In the adjoining case is the original Cap-Blanc skeleton obtained from M. Grimaud. The remarkable state of preservation makes this Magdalenian skeleton a unique treasure in the United States.

In the case opposite is a reproduction of the bisons of clay which are preserved in the innermost part of the cave of Tuc d'Audoubert in the Ariège district of France. These clay models, showing a male bison following the female, suggest a fertility rite. The excellence of the modeling, combined with the finesse of the details, shows the great artistic ability of the Magdalenian sculptor. This cave is located on the estate of Count Bégouen, through whose courtesy this reproduction was made by M. Lacomme in the Toulouse Museum.

During a visit to the cave of Tuc d'Audoubert in 1930 in the company of Count Bégouen and the Abbé Breuil, a cast was taken of a Magdalenian footprint still preserved in the hardened clay. The footprints around the reproduction were made from this cast.

The Magdalenian exhibits consist of type series of flint and bone tools from various sites in southwestern

France. Among the objects of particular interest are the following: bone harpoons from Limeuil; a perforated bone, which may have served as a whistle, from La Souquette near Sergeac; the remarkable series of engravings from Bedeilhac (Ariège); limestone slabs, used as the earliest form of lamps, from Mas d'Azil; a fragment of coral worn as a pendant, and the head of a lizard engraved on a block of stalactite from Grotte de la Mairie; and a perfect bone needle from Ganties (Haute-Garonne).

There are also collections from Altamira, Abri Mège, Massat, Gourdan, La Roque de Montespan, and La Tourasse. There are original fragments of human skeletons from La Roche de la Lalinde, and casts of the Obercassel and other Magdalenian skeletons. In Case 8 is a pair of magnificent mammoth tusks from the Lena River, Siberia. There are, in addition, copies of drawings of mammoths by prehistoric artists. A series of photographs of cave paintings and engravings is shown in this case, and on the walls are drawings by Amedée Forestier and colored copies by P. Cassien.

THE MESOLITHIC OR TRANSITION PERIOD

The paleolithic period had come to a close, and the transition period between the old and new stone ages began. The climate in western Europe had become very like that of the present day. When the ice sheets had almost completely melted away, the arctic flora was replaced by the birch and the pine. The barren tundras and wind-swept steppes were superseded by richly forested landscapes. The modern fauna, characterized by the red deer, had taken the place of the cold-loving mammoth and reindeer. During that period the mammoth became extinct, and the reindeer retreated to its present home.

The mesolithic period consists of the following six cultures: Azilian, Tardenoisian, Asturian, Maglemosean, Kitchen Midden, and Campignian, although no chronological sequence is thus indicated.



AZILIAN BOAR HUNT WITH DOMESTICATED DOGS, MAS D'AZIL, FRANCE

Group VI in Hall C

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AZILIAN CULTURE

The last of the hunting races roamed the soil of Europe at that time. They have been called Azilians, after the type station located in the cavern of Mas d'Azil (Map, p. 43) about forty miles from Toulouse. The art of the Azilians was degenerate compared with their predecessors, the Cro-Magnons, whose beautiful realistic work they replaced by conventional designs. Neither did they make engravings or sculptures, and their painting was limited to simple designs in red ochre on flat pebbles.

Among the treasures excavated by Piette were these painted pebbles selected by the Azilians from the bed of the river Arise, which flows through the tunnel of the Mas d'Azil. Red ochre was powdered by means of a stone pestle and mortar, and applied to the flat surface of the quartzite pebble with the tip of the finger or by means of a fine brush. The color was thick, and was probably fixed with some organic substance. The designs are in the form of dots, bars, wavy lines, or combinations of these designs. The motive that prompted the painting of the pebbles and their use are unknown. Piette believed that they represented a system of cursive writing. Breuil and Obermaier suggest that in some cases the paintings represent conventionalized human forms similar to the stylistic mural figures in the copper age art of Spain. The theories have also been advanced that these painted pebbles were of the nature of money, counting boards, talismans, or playthings. An excellent series of painted pebbles is shown in Case 11.

The most distinctive Azilian implements were the flat, broad harpoons, with one or two rows of barbs, generally made with a hole near the base to take the line by which it was loosely attached to the shaft. The harpoon was carved from the compact outer layer of stag's antler. The only other bone implements were chisels, simple punches, rough bone awls, and bone polishers. There were a number of poorly made flint

tools, including small round scrapers. The perforated teeth of the horse, bear, and wild boar as well as various shells were worn in necklaces.

Cattle, horses, and pigs formed the chief food supply, although at that time these animals had not been domesticated. It was during that time that the dog was tamed and finally domesticated. The assistance of this faithful companion in the hunt might well compensate for the inferior quality of the hunting weapons, which consisted of long, wooden spears with flint blades attached.

From burials in Azilian deposits it appears that at that time there were both a long-headed and a broad-headed race in western Europe. The Cro-Magnons had long heads and broad faces—the so-called disharmonic type—but the new long-headed race had narrow faces.

The most remarkable Azilian burial was found at Ofnet in southern Germany. Twenty-seven human skulls, buried in red ochre, were discovered in one grave. The skulls, orientated toward the setting sun, together with a few vertebrae of the neck, alone were found. Evidently the skulls were buried after decapitation, together with necklaces of perforated shells and deer's teeth. One of the vertebrae shows the marks left by the flint knife used for severing the head from the body.

The Azilian culture has also been found in Scotland. There is archaeological evidence from discoveries at Oban, and also on the islands of Risga and Oronsay that between 13,000 and 10,000 B.C. North Britain was inhabited.

Flint tools are rare, small, and badly made, but finger-like water-rolled native pebbles were probably used as skin-smoothers, and by this use acquired a bevel-end. Sections of horn and bone were also employed in this manner. Bone and antler harpoons, borers, and other tools were used. Pieces of pumice stone were utilized for rubbing purposes. Anvil stones and elongated pebbles pitted near the end indicate by the nature of the pitting that they were used for breaking the shells of the dog-

whelk, which are always found broken. Stone clubs, used at times as choppers, were excavated. Cowrie-shells were perforated for suspension in necklaces.

Animal remains also indicate the nature of the food eaten by the shore-dwelling Azilian people. In Case 11 there is a representative series of Azilian material from Scotland, excavated by Ludovic M. Mann.

The cradle of this culture is not known, but Azilian industry is distributed over northern Spain as far west as Asturias, the French Pyrenees, eastern France, Switzerland, Belgium, and England.

TARDENOISIAN CULTURE

The Tardenoisian culture has elements in common with both the Azilian and the Campignian techniques, but there is an absence of painted pebbles. The typical flint implements are small geometrical flakes, usually referred to as microliths or "pygmy" tools. These were inserted into wooden or bone handles and held in position by bitumen or gum of some sort in order to form a knife blade or a kind of saw. This is a new type of composite tool. The microlithic technique is referred to as the Tardenoisian industry, since numbers of these "pygmy" flints occur at Fère-en-Tardenois in France.

The physical types appear to have been closely connected with the Azilians. In 1867 round-headed Tardenoisian skulls were found near Furfooz, Belgium.

The distribution of the Tardenoisian culture is important. It appears to have been concentrated around the Mediterranean region, but spread into northern Europe, south into northern Africa, and east to Poland and southern Russia. The microlithic industry is also represented in Kenya Colony, British East Africa (Case 11), by obsidian scrapers and knife blades of various types.

ASTURIAN CULTURE

The Asturian culture is named after the province in northern Spain, where it was discovered by Conde de la

Vega del Sella. The sites indicate that these people lived a primitive existence near the sea, since the remains consist of kitchen midden refuse formed for the most part of shell-fish cemented together by a stalagmitic deposit. The industry includes a new type of tool or pick made by pointing a hard river pebble (Case 11). Smooth pebbles were used as rubbing stones or hammerstones. A few crude bone tools were excavated. The quality of the local quartzite rendered it difficult to make well-finished tools.

The fauna comprised horse, pig, chamois, otter, wolf, hare, ox, red deer, roe deer, polecat, badger, and wildcat. There is no evidence of domesticated animals. The climate was warmer than that of Asturias at present.

This culture is found near Biarritz, also in Catalonia, and possibly in northern France.

MAGLEMOSEAN CULTURE

The center of the Maglemosean culture is Denmark and the coasts of the Baltic. The type station is the Maglemose or great bog of Mullerup, on the coast of the island of Seeland. These people lived on the banks of large lakes, or even on rafts in shallow water. The character of the flora and fauna proves that this culture antedated the oldest Danish kitchen middens (p. 35). Elk, stag, roebuck, wild boar, and *Bos primigenius* were dominant. There were no domestic animals, with the possible exception of the dog. At Svaerdborg thousands of flint chips and rejects were found, proving that this site was a large workshop. There were also several hundred tools of deer-horn and of bone. The fauna was that of a lake and forest area. Canine teeth of wild boar and incisors of beaver were used as cutting tools. Perforated teeth of *Ursus*, *Bos*, and the otter were worn.

The flint tools consist of microliths, scrapers, and a few picks. The "pygmy" flints were hafted in a bone handle to form a composite tool. The typical implement

of the culture is the small, narrow harpoon barbed on one side. This tool does not occur in the later shell mounds, or in the kitchen midden deposits. There are also many types of bone implements, such as points, awls, needles, and fish-hooks. Perforated antler tools and hafts are also typical of the Maglemosean industry. The bone tools are often ornamented with a series of fine, engraved lines and geometrically arranged punctuations. Sculptures of animals carved in amber may belong to this period. Industries similar to the Maglemosean have been recognized in England and Poland.

KITCHEN MIDDEN CULTURE

In Denmark the epoch of the kitchen middens must have begun some six or seven thousand years ago, and may have lasted for a period of two thousand years. Discovered by Steenstrup and Worsaae in 1851, the kitchen middens yielded many stone implements, of which one hundred thousand were found at Meilgaard. Shells, the majority of which are from the oyster and cockle, were roasted in the fire. Bones of the sole, herring, eel, duck, goose, swan, and sea gull are not uncommon. Mammals are represented by stag, roebuck, *Sus*, *Bos primigenius*, bear, wolf, beaver, and wildcat. No reindeer bones or bones of any domesticated animal, except the dog, were found. Bones broken in a uniform manner by a single stroke were heated to remove the marrow more easily. No marrowbone was wasted. The oldest industry was contemporaneous with the fir tree and the pine. The oak had just made its appearance.

Kitchen middens have also been found in many other parts of the world, including the coast of France, Portugal, northern Africa, Japan, and America.

CAMPIGNIAN CULTURE

The Campignian period is called after the type station of Campigny near Blangy-sur-Bresle in the department of the Seine-Inférieure, France. The site consists of a

number of land habitations in the form of huts (*fonds-de-cabanes*). The culture at Campigny represents an early stage of the neolithic period before the art of polishing stone as a shaping process was known. Among the flint implements were noted Mousterian and Magdalenian survivals, also new forms such as pick, paring knife, and the transverse-edge arrowhead. Pottery, both crude and fairly fine, although without ornamentation, and milling stones show that the population no longer depended primarily on the chase and that the first steps toward the conquest of the soil had been taken.

In Hall C the section dealing with the mesolithic period contains the most dramatic group of the entire series (Group VI). Since the domestication of animals is a definite advance toward civilization, a wild boar hunt is represented at the entrance to the Mas d'Azil. During that period the dog assisted the hunters to kill their quarry. The scene shows two Azilians at close quarters with an enraged wild boar defending his mate and two young pigs. The hunters are armed with wooden spears with flint lance-points. Five dogs are shown in the group. With a rawhide strap three of them are held by one of the hunters, who is leaning back from a crouched position as the dogs strain forward at the leash. One dog is lying dead near the water—the result of coming within range of the sharp tusks of the male boar, which is being kept at bay. The modeled part of the background shows the entrance to the cave. On the painted portion, the peaks of the Pyrenees can be seen in the distance.

The mesolithic cultural material is exhibited in Case 11. There are a series of painted pebbles and objects from Mas d'Azil, a representative Azilian collection from Scotland, and original human skull fragments from the Ofnet burials. Tardenoisian objects from Sauveterre-la-Lémance, small Maglemosean and kitchen midden series, and objects of Asturian and Campignian cultures are also

represented. One of the most interesting exhibits is a restored section of a Danish kitchen midden.

THE NEOLITHIC OR NEW STONE AGE

The people of the neolithic period, who probably came into Europe from those regions which lie east of the Caspian Sea, brought with them the new culture upon which our modern civilization rests. Among their contributions were the practice of agriculture, the true domestication of animals, which involves breeding in captivity, the manufacture of pottery, and tool-making by grinding and polishing.

Agriculture and the domestication of animals played a large part in the early development, because the finest hunting ground can support only a limited number of families, whereas with sheep, cattle, and grain a fertile and well-watered soil can be made to produce food and clothing for a large population. It is possible that paleolithic man may have tamed wild animals occasionally so that they worked for him, but true domestication of the sheep, goat, pig, and cattle did not take place until the neolithic period. It is interesting to note that the horse was not domesticated until early historical times.

Fragments of pottery have been found in upper paleolithic deposits, but it was not until the neolithic period that finished jars were produced. The jars were often ornamented with simple designs made with the finger, a fiber cord, a pointed stick, or a bone. Toward the close of this period pottery decoration included both engraved and painted vessels. In northern Europe three general groups of pottery can be distinguished—the banded, corded, and calyciform types. Since pottery is almost indestructible, a single sherd may tell a long and reliable story, because over wide areas the general type shows remarkable similarity and persistence.

The invention of the processes of grinding and polishing flint or any fine-grained compact rock so as to obtain a

sharp and tough edge, was indeed a great advance over the technique of the paleolithic flint-knapper. The grindstones were often made of sandstone, but blocks of flint similar to the example in Case 12 were also used. Flint was mined to a depth of forty feet at Grimes Graves near Brandon, England, by means of deer-antler picks. This raw material became one of the important articles of commerce at that time.

Neolithic man lived in huts, which were often grouped together to form a village. The most primitive form of hut was the pit dwelling, either circular or oval in shape, but occasionally in the form of a roofed trench with a fireplace. In late neolithic times wooden houses with several compartments were made, occasionally with two stories.

In Europe the population was more homogeneous than at the present time. A survey of neolithic skeletal remains, however, shows that the majority of the population possessed long heads, although skulls of round and intermediate form have been excavated. The peoples with long heads and long faces are direct descendants of the Azilians, while the short-faced or disharmonic type is derived from the Cro-Magnons of the Magdalenian period.

In northern and western Europe tombs were constructed with large, roughly dressed stones, many of which weigh several tons. The method employed to drag these stones to the desired place and raise them to an upright position is unknown. The tombs are of various types, including the dolmen (a large, flat slab of rock supported on three or more uprights), passage-grave, corridor-grave, and stone-cist, where the small chamber containing the body is buried under a tumulus or mound. In addition to special tombs, there are single standing stones, known as menhirs, marking burials. Circles of small menhirs are known as cromlechs. Menhirs placed in parallel lines are known as alignments, the most important of which is at Carnac in Brittany, where there



SUN-WORSHIP AT CARNAC ALIGNMENT, FRANCE
Group VII in Hall C

are ten avenues of large stones stretching for two miles from a large cromlech. Stone monuments of these general types are usually referred to as megaliths.

A general view of the Carnac alignment (Group VII) is shown in the hall. This great line of menhirs, running east and west, must have been a place of worship of the sun, possibly combined in some way with the cult of the dead. The priest is shown with his hands outstretched toward the rising sun, which casts long, dark shadows behind the great blocks of weathered granite. He is welcoming the new day.

The wide distribution of these simple stone monuments is shown by their occurrence in Europe, Africa, and Asia, where they are found as far east as India.

In the two cases (12 and 13) opposite the Carnac group is a series of neolithic artifacts from various parts of Europe, together with photographs of various megalithic monuments in France and England.

This section overlaps, to some extent, with that of the Lake Dwellers who inhabited Switzerland from neolithic times to the Roman period.

THE SWISS LAKE DWELLERS

In the latter part of the neolithic period the use of buildings constructed on piles was widely distributed over Europe, Switzerland being the principal center of this type of culture. During the winter of 1853-54 the water in Lake Zürich receded to an unusually low level, as the result of a drought. In this manner the first pile-village was discovered.

The Swiss Lake Dwellers discovered that huts constructed on pile-supported platforms had several advantages. By means of a primitive drawbridge the village could be made reasonably safe from attack except by boat. Furthermore, the lake dwellings enabled the people to catch fish with ease and to dispose of their refuse through holes left in the platforms. The piles consisted of rough

stems of oak, beech, fir, pine, and birch trees, secured from the neighboring forests. In the majority of cases the bark was not removed. The ends, pointed by means of stone axes, were hardened in the fire and driven into the bed of the lake with heavy stones or crude mallets. In cases where the floor of the lake was marshy, the piles were kept in position by stones piled thickly around their bases. To make the platform, trunks of trees, often ten to twelve feet in length, were laid across the piles and secured to them by wooden pins. The rectangular huts were thatched with bark, straw, reeds, or rushes. The sides were made of wattles, covered inside and out with a thick layer of clay.

The Lake Dwellers were undoubtedly an industrious people. They raised cattle—an occupation requiring continuous care and foresight, as did the cultivation of the ground and the sowing and reaping of harvest crops. Among the plants cultivated by them was flax, which they spun into thread and used for weaving into cloth and making fish nets and seines. The cereals consisted of wheat and barley, charred examples of which are shown in Case 14. The most common fruits were apple, cherry, raspberry, blackberry, and grape. Caraway and poppy seeds may have served as flavorings.

Among domesticated animals were cows, goats, sheep, and pigs. It is interesting to note that only the pig was eaten when very young, which is probably due to the fact that the Lake Dwellers obtained milk from the cow, goat, and sheep for as long a period as possible.

These people were also successful hunters, since they killed bear, lynx, wolf, stag, roe deer, wild boar, beaver, otter, and squirrel. The European bison and the urus, the long-horned wild ox, were among the animals now extinct. They ate the meat and used the bones and teeth for weapons and implements. The discovery of a few fragments of leather suggests that the skins were used, possibly for clothing.

The discovery of weaving by means of vegetable fibers became an important development. While no complete looms have been found, many clay cones and weights and clay and stone spindle whorls have been excavated. Samples of woven material are shown in Case 14.

The pottery, simple in form, consisted chiefly of round-bottomed jars and pots which were held upright on hardened clay rings.

The earliest flint tools and weapons consisted of arrowheads, spearheads, celts, daggers, axes, adzes, knives, saws, scrapers, borers, and chisels, besides a number of objects whose precise function is unknown. Occasionally the arrowheads are found attached to their shafts by an adhesive material. The stone celts were usually hafted into a casing of horn, which was then secured to a wooden handle by means of animal sinews and leather thongs. Many instruments were also made from horns, bones, and the tusks of the wild boar.

Simultaneously with the introduction of copper and bronze objects, appear for the first time flint implements of a honey-colored, translucent quality, found only at Grand-Pressigny, Indre-et-Loire, France. This shows that the finest flaking flint in Europe formed part of an early medium of commerce. The Lake Dwellers also procured their first metal objects by trade, but soon afterwards they imported the raw materials and copied their wooden and stone implements first in copper and later in bronze. They were able to make elaborate bronze bracelets, pins, pendants, buckles, and polished mirrors. Bronze bits were made for their horses. Beautiful knives and swords came into use.

With the advent of these new materials, their civilization developed fast, but when a people who understood the use of iron came among them, probably as conquerors, the Swiss Lake Dwellers, as representatives of an individual culture, virtually disappeared. Shortly after this the lake

dwelling were abandoned, and within a few centuries Rome became the dominant power.

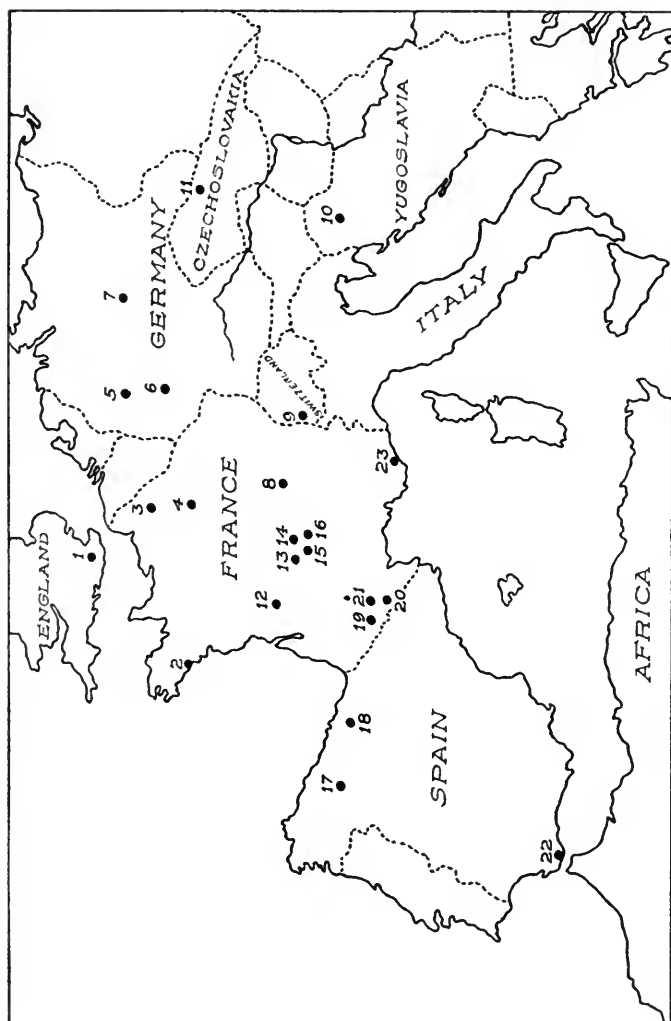
In Hall C (Cases 14 and 15) there is a fine collection of objects from Lake Neuchâtel excavated some forty years ago by J. Thiessing. The objects comprise implements of stone and bone, pottery, examples of weaving, samples of charred wheat and barley, seeds of various food plants, sections of wooden piles, and objects of bronze and iron. The photographs made by R. R. Schmidt of Tübingen show the ground plans of the houses excavated at Federseemoor in southern Germany.

The large group (VIII) shows an early morning scene on Lake Neuchâtel. In the foreground two fishermen are hauling in their seine, which contains the first catch of the day. The surface of the water reflects the pink glow of the dawn, which gives the snow-clad Alpine peaks a roseate hue. On the right is painted the village with its cluster of thatched houses built out over the water. The villagers are beginning their daily tasks.

The dawn of the historical period is at hand.

The cultural objects placed on exhibition represent a small proportion of the Museum's prehistoric archaeological collections, which are available to qualified students in the Study Room of the Department of Anthropology. From time to time additions will be made to the exhibits in this hall.

HENRY FIELD



MAP OF PREHISTORIC SITES

1, Piltdown; 2, Carnac; 3, St. Acheul; 4, Chelles; 5, Neanderthal; 6, Mauer; 7, Ehringsdorf; 8, Solutré; 9, Neuchâtel; 10, Krapina; 11, Predmost; 12, La Quina; 13, Le Moustier; 14, La Chapelle-aux-Saints; 15, La Ferrassie; 16, Cap-Blanc; 17, Asturias; 18, Altamira; 19, Gargas; 20, Aurignac; 21, Mas d'Azi; 22, Gibraltar; 23, Mentone.

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LAKE-DWELLING SCENE AT NEUCHÂTEL, SWITZERLAND
Group VIII in Hall C

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